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Regional Strategies to Meet Globalization: How Single Plants Innovate together to Remain Viable and Secure Employment. The Grenland Industrial Cluster and Telemark¹

Thoralf Ulrik Qvale

The article outlines the background and action research strategy followed in a large scale development project in the Telemark region SW of Oslo. The project is a part of a national, tripartite, R&D programme, “*Value Creation 2010*”, which started in 2000 as a continuation of the series of work life democratization efforts initiated in 1962. The choice of action research methods applied is explained and discussed. Further, we present the practical outcomes in terms of commitment to new ways of organizing work across boundaries, the economic performance of the networks, the creation and securing of jobs and organisational innovations. The potential for further economic development in the region is discussed.

Key words: Action research strategy, regional economic development, industrial networks, innovation, participation

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1. Introduction

The main theme for this paper is the practical side of action research, in connection with attempts to institutionalize large-scale change in work life. This I will do in three ways; 1) The action research aspect is dealt with, – not at the level of epistemology, – but as practical research strategy and associated methodologies and concrete interventions, the assumptions we were building on, ideas we have introduced and events we helped organize. 2) I present the concrete problems, which the initial core companies (7-8 process plants in the same area) addressed, and how they have tried to resolve these. 3) I discuss the most important practical outcomes in terms of organizational innovations, cost savings, new business, new investments and changes in institutions and policy and politics at the regional and national levels. This is not done in order to argue that the Telemark development is a complete success. It is not, but there are interesting developments and experiences of large potential if continued. Further, as argued also by Gustavsen et al. (2008) reports from action research during the last decades have tended to become extremely abstract and mainly concentrated on epistemology, theory of science and linguistics. Thus they have become rather detached from practical issues like methodologies and results of the action. So I see a need to bring practice back in. 4) Finally, I discuss implications of the experiences from this project for further action and present some of the new knowledge developed.

As will appear, I argue that the historic dimension is important also in Telemark, – the county/region in which the project takes place. When the specific national R&D programme *Value Creation 2010* (VC2010), of which the Telemark project is a part, started in 2000, there were leadership, organizations and policies in place facilitating the subsequent development of Telemark and its industrialized coastline, Grenland. This area had retained a “rusty belt” image, all the way into the 1990s, in spite of its advanced/modernized, internationally oriented process industry, and emerging new industries in several sectors (ICT, engineering, construction, biomedicine etc). The political and industrial leaders in Telemark, and particularly in

Grenland, agreed that it was high time to improve the region's image, do something with the population's self esteem, raise a spirit of entrepreneurship, attract new investments, modernize its infrastructure and institutions, create new cultural activities, improve the quality of the external environment etc. All these issues had been debated at the municipal and county levels and agreed and accepted policies were formally in place by the time VC2010 started. New activities also had been started, – the external environment had been cleaned up, the cities renovated, new theatres and other cultural institutions created, a programme for entrepreneurship across all school levels was in place, and a joint public/private development agency (Vekst i Grenland) for the four Grenland municipalities had been established (see www.vig.no).

A particular issue for Grenland is that the legitimacy of its large process industry still is very strong. The main labour market organizations, LO and NHO, have been strengthened through the 1990s. This is in contrast to most other parts of the country. The tripartite collaboration between the labour market organizations and the political system in Telemark remains very close. Further, through the 1990s the partners developed a joint understanding that the region's still extreme dependency on the process industry was unhealthy, and ought to be supplemented by other kinds of industry and employment opportunities. The employment in the 7 – 8 process plants had been dramatically reduced through the 1990s (typically reducing manning in each plant by 30-50%, increasing production output by 30-40% and improving quality significantly), and they realized all *new* employment would have to be found outside these plants. So although the partners wanted to retain the process industry and help it expand, the need for a more varied labour market was clearly seen. (1).

The long lines: In the period 1966-73 three plants within Norsk Hydro's production complex in the Grenland area ca 170 km SW of Oslo, became involved as the last in the series of four pioneering "field experiments", testing out new participative forms of management and organization within the Industrial Democracy Programme (Emery/Thorsrud 1976). Norsk Hydro was the largest industrial enterprise in the country at the time, and was among the world's largest producers of mineral fertilizer, aluminium and magnesium. Particularly the first Hydro project, in a brand new fertilizer plant

(Gulowsen 1974), run in co-operation between the local union and managers, corporate top management and researchers turned out an immediate success. It was seen as a break through in Norway, attracted considerable international interest and inspired similar action research programs in other countries. As a newly recruited researcher, I became involved and gradually responsible for the project in the magnesium plant (1968-73) (Emery & Thorsrud 1976). However, when the dramatic reorganizations in the process plants in Telemark started around 1990, there were no direct links between the “field experiments” in the Norsk Hydro plants there, and the new developments. The changes were initiated by new leaders for different reasons, with different inspiration, but following participative procedures and processes, which reflected the general industrial relations culture in Grenland at the time.

In spite of strong top management support the development in the Norsk Hydro plants in Grenland stopped, and gradually became encapsulated (Herbst 1976), and reversed during the 1970's. The national impact of the “field experiments”, however, was sufficiently strong to initiate important reforms in national labour laws (Gustavsen/Hunnius 1981) and collective agreements, and to trigger a series of tripartite programmes testing more effective models for the institutionalisation of experience from the initial “field experiments” (Gustavsen 1992; Qvale 2002). The following “Value-Creation 2010” programme (VC2010), which started in 2000, and now is being transformed into VRI, is the most recent (Gustavsen et al. 2001). VRI is the acronym for “Development Agencies in Regional Innovations Systems”, and is a newer programme (initiated in 2006) intended to give continued support to the VC2010 actors and to a number of other programmes and actors dedicated to regional development.

The time dimension in such development obviously is important and explains why we devote so much space to describing the history of the work life in the region. The key relationships and trust between persons and institutions in Telemark have developed over periods of 10 to 40 years and have been tested in different ways before merging in VC2010 in that region. This is a parallel to experience from Emilia Romagna (Mazzonis 1991) where the development centre was set up in the 1970's. The centrality of the time dimension also emerges from the well-known action research project in

Jamestown, USA (Trist 1976, 1983). In this case, however, the time span became too short to allow for the development of collaboration across the enterprises. From the Norwegian programmes ED2000 and VC2010 we find that in the regions where the regional development coalition is moving ahead, it is benefiting from industrial networks that have collaborated with R&D centres over periods of 10 years or more. This is the case e.g. with NordVest Forum, Rogaland, and Vestfold (Gustavsen et al. 2001; Claussen 2004).

In the wake of the recession 1988-92 renewed interest in integrated, team based, flexible and participative forms of management and organization appeared in Norway's process industry. Inspiration came partly from the national series of action research projects, notably in the offshore petroleum industry (Hanssen-Bauer 1990, Qvale 1992), and more importantly from leading international operators like Shell and DuPont. In the Grenland area there were seven still large process plants owned by five different international, leading corporations. Under the auspices of the *regional* section of the Confederation of Norwegian Enterprises (NHO) the plant managers had also started to meet regularly to discuss matters of common interest.

Further, from 1998 some of the Grenland plant managers, local union leaders and key representatives from corporate headquarters had participated in the twice-a-year Advanced Management Forum for the Process Industry (FNDP) which WRI is running in order to support the transfer of experience about management, organization design and development across this sector of industry (Qvale 2000a).

Restarting large-scale change in Grenland; After 1998 most of the plants in the process industry, including those in Grenland, were losing money. They were suffering from a 10 years' period of low rates of investments, a rising rate of exchange for Norwegian currency, falling prices on the world market and high Norwegian costs and duties, within a national regime, which did not promote policies supportive to this kind of industry. The political threat of new national duties on CO₂ emissions further discouraged the corporations from making new investments in the Grenland plants.

Therefore the plants' managers jointly realized that their current plant level strategies would not suffice in regaining and maintaining competitiveness. The ongoing optimizing of the plants through "lean, team based, or-

ganizations”, “continuous improvements”, smaller investments in “streamlining the plants”, taking out “bottlenecks”, better control systems, product improvements and creative use of new ICT systems had come far. The rate of internal innovations had been high for close to 10 years. However, this kind of development no longer could offset the handicap created by their relatively low production volumes. New plants abroad tended to have two to four times the capacity of those in Grenland and normally also access to cheaper energy and raw materials. The plant managers therefore decided to form an alliance to explore the only clear option available, – working together to achieve some regional kind of economy of scale and also to influence the development of their common external environment or infrastructure.

This alliance across the 7 (later 8) plants developed into what they later named *ICG* (the Grenland Industrial Cluster) (2). The group constitutes the largest concentration of advanced process industry in Scandinavia (ca 5000 employees, a yearly turnover of ca 2 bill+ Euros and all plants located within a circle with radius 15 km). Together the companies control large professional and technical resources and also have a fairly well developed infrastructure for this kind of industry. This includes a positive political and social environment for heavy industry, a good labour market with access to highly skilled workers used to shift work, well developed, positive industrial relations, in addition to deep water harbours, fairly good transport facilities, access to power and water, local well qualified suppliers/contractors, adequate local education institutions and so on. The benefits of acting like a cluster, as understood by the ICG managers, were mainly expected to be in the form of a better, even more competent, flexible, effective and well functioning infrastructure in the region. Although logistics get most attention because very large amounts of raw materials and products have to be transported, and transport costs therefore are very significant, issues like the quality of education, leisure activities, R&D, suppliers, cultural institutions, recreation facilities etc. also are seen as strategically important.

The ICG leaders and the local administrators all realized that to uphold employment in this region of 100.000 citizens, new businesses would have to be set up and grow. Further, because the future of some of the plants seemed very bleak and might lead to closure, there was fear that the infrastructure for

such process industry would erode. Hence, unless they acted quickly, all the plants might be forced to close one by one over the next 10-20 years.

They also knew the number of jobs in their plants would continue to go down. Therefore they assumed the best thing they could do to support employment and secure the infrastructure for process industry in the region was to keep the existing plants competitive, and to attract new, relevant, enterprises to the region. Later they also found that spinning off “non-core” functions and units, which might grow on their own, could create new jobs.

Bringing in action research again: There was a common understanding among these managers that one of their important assets was the high level of trust and co-operation between management and local unions, and also across the enterprises and the municipal and regional populations and administration (“the Nordic model of industrial relations” was and still is in high regard in this region). They were well aware of the concern in the region for its economic development and employment situation, and knew that to have their employees and local unions as active partners; they would have to address these issues in parallel to working with the plants’ economic performance.

They also thought the fact that Grenland had the largest aggregate of advanced process plants in Scandinavia, should or could provide some competitive advantage. Upon an invitation from WRI, the plant managers and the local union leaders in 2001 agreed to join the national R&D tri-partite programme VC 2010 (Gustavsen 2004a, 2004b) because they deemed the programme to be consistent with their own values and strategy. They assumed the WRI could provide methodological support as well as national legitimacy to their own efforts. So, after an absence of 25 years, I was back in Telemark under the auspices of a national program again.

As appears, the national programmes for the democratisation of work life over the last 40 years have changed their focus *from* being solely concerned with ways to promote more democratic forms of work organization also *to* cover innovation, regional economic development, employment/job creation and also the quality of life in general. VC2010 represented a national break through also in this respect because it is the first time national institutions like the Research Council and various Ministries formally accept that such programmes for participation and partnerships can be very important for em-

ployment, innovation and economic development. Hence the social science based programmes have been taken out of the industrial relations and welfare categories, and brought into the realm of industrial and economic policies. The need to do this had been pointed to also by the evaluators of one of VC2010's predecessors, SBA (Davies et al. 1993) and also strongly put forth by a EU Green Paper on partnership and work organization a few years later (European Commission 1997).

In practice, however, it has turned out almost impossible to influence policymaking at the national level in effective ways, – i.e. across a large number of national actors and stakeholders. There normally are too many conflicts of interests, political differences, agendas, new initiatives and influences to make this level manageable through the action research methods we know. At the *regional level*, however, where the common interest and fate can be more clearly seen, and the number of actors is considerably smaller, we have action research methods, like conference methodologies, through which a sufficiently large proportion of the stakeholders can be brought together, make an analysis of the situation and develop plans and strategies for the future, as also pointed out in the case of the New Baldwin Corridor in Pennsylvania (Chisholm 1998) and demonstrated by Eric Trist and colleagues in the Jamestown project in the 1970's (Trist 1976, 1983). This way the stakeholders or partners also can learn to utilize action research centres (like a regional University College), and a diffusion of participative methods for enterprise and regional development may take place.

Further, a change in epistemology in social science is taking place, giving action research scientific legitimacy and gradually becoming accepted as part of mainstream social science. On one side, the criticism of positivism in the social sciences has made considerable headway over the last decades. On the other side, social constructivism, linguistics and other non-positivistic epistemologies or orientations are gaining a stronger foothold. (see e.g. Gustavsen 2004c; Pålshaugen 2004). Action research and related approaches to social science therefore are gradually becoming recognized as science and are well represented e.g. on international conferences and in the research literature (see e.g. Reason/Bradbury 2008 for an overview). Several international journals have been started, and chairs and also PhD programs dedicated to

action research at Universities have been created (see e.g. Levin 2003; Baburoglu/Emery 2000). Well established journals are gradually more accepting towards action research based articles. In Norway a breakthrough in research policy came in the early 1990's when national R&D programs specifically targeting action research started emerging. In terms of organization theory, the rapidly growing interest in worklife and research for concepts like learning organizations and organizational learning (e.g. Argyris/Schon 1996; Senge 1996; Argyris 2003) also supports this trend.

Taken together these trends and developments can be summarized as:

- Strong, determined leadership among the social partners in Telemark based on an appreciation of the Nordic model for participation in work-life, and a concern for not just their immediate membership, but for other parts of work life and infrastructure in the region.
- A commonly felt need for change, bordering to a feeling of crisis in the region's leadership: The "rusty belt image", low self-esteem and passivity of the population following a long period of dominance from large, paternalistic corporations, depopulation, unemployment.
- Dialogues between industry and regional political parties about the need to work together to secure employment and sustainable economic development.
- New production engineering principles in advanced process industries (participative, flexible, integrated forms of organization combined with advanced use of ICT).
- Acceptance of the link between participative forms of management and productivity/innovation.
- A new paradigm in social science acknowledging action research
- Inspiration from economic and innovation theory, notably Porter's ideas about cluster development and e.g. Edquist's (1997) systems of innovation.

Taken together we assumed these changes should provide favourable conditions for developing and testing in practice new forms of democratic man-

agement and organization. Compared to the situation 35 years earlier, only the need for change due to economic pressures and the threat of plant closures seem similar. In those days the strong belief in “Scientific Management” was seen as the main obstacle to democratic change. (Trist 1970; Emery/Thorsrud 1976).

2. The research strategy in Telemark

WRI has a triple research agenda in Telemark; 1) To give methodological, action research based, support to the regional *development coalition* (Gustavsen et al., 1998) and its various projects, 2) to document the change processes and produce scientific publications from the project and 3) to help the building up of action research competence and capacity at the regional university college.

Let us first look at what we have been doing in practice, and why we have been doing so. For simplicity we may distinguish between different phases in our work in Telemark;

Phase 1: Gaining access: Through VC 2010 the WRI has been involved in three counties since 2001: Buskerud, Vestfold and Telemark. In each we were expected to help the setting up of a regional development coalition and to link this to networks of enterprises. Ideally these networks should have been formed through the preceding ED2000-programme. In practice, however, it could mean starting from scratch. Telemark was a bit of a special case. The *development coalition* partly was in place on own initiatives and was expanding by the time VC2010 started (3). Further, WRI had a long standing working relationship to a number of the corporations and to some of their specific Telemark process plants, – some going all the way back to 1967. These corporations, through plant managers, local union leaders and some corporate representatives had since 1998 participated in the FNDP project (Qvale 2000a). For the WRI it seemed natural to build on its relationship to the Telemark members of this forum when joining VC2010. On a Forum meeting in May 2001 the VC2010 research director presented the programme, and the managers/union leaders from the Telemark plants agreed to join and to invite WRI as its research partner.

On two conferences run by VC2010 for the three counties during the summer 2001 Telemark participated through representatives from the municipalities, counties' administration, a number of public institutions like education, R&D, public agencies for economic development and *the leaders of the Telemark labour market organizations*. The latter voiced quite strong scepticism to "another national programme" which they feared would force them to stop doing what they already were doing, and to do something else in order to get access to some money. They felt they already had their development coalition; they had their plans for regional economic development and also a number of projects running or in the pipeline. Only after rather lengthy discussion through which we explained that we mainly would offer methodological support to *their* projects, and that we saw no need to discard what they already were doing, were they willing to meet us after the conference, and to discuss in more detail.

Phase two: Organizing, building trust: The 14 managers and local union leaders of the 7 process plants in Telemark, however, already had invited WRI in as research partner based on the established relationship. Together they formed a Steering Committee for the ICG development in which WRI and also the leaders of Telemark branch of the union (LO) and employers' federation (NHO) became members. The Steering Committee normally meets 6 times a year, while the smaller Executive Committee of 5 (one plant manager, one local union leader, the LO and NHO leaders and the researcher) meets 1 to 2 times a month. A small secretariat also was created. The activities have been financed through contributions from the ICG plants.

In addition the social partners also formed a steering committee for VC2010 in Telemark in which WRI was not represented the first couple of years, but involved other regional development actors, the College, and county level administrative officers. During the first 5-6 years, however, dynamics were concentrated around the ICG development, while the (higher) VC2010 level merely provided legitimacy and should prepare the ground for more widespread changes later.

Discussion about values, strategies and project ideas flourished on the meetings in these various committees. At this time all ICG plants were losing money and were under heavy pressure to cut costs. Therefore the managers

promoted rather short term cost cutting ideas, while the local union leaders asked for more offensive projects which could immediately create new jobs. WRI's member of the committee was rather passive at the meetings during this period and mainly engaged himself in the issue of designing a process that could make the field move. A dialogue conference (Gustavsen/Engelstad 1986; Gustavsen 1992; Pålshaugen 2002) with broad participation from the plants and the region was proposed. The purpose should be to have dialogues about what the situation looked like, what would be a desirable future, what could be done to realize this future, and who could do it. WRI was only partly heard in its proposal for bringing in potentially relevant *external* actors. The managers wanted to give priority to internal participants (from the ICG plants). The local union leaders were at this time in general sceptical and worried about their members' reactions to collaboration on cost cutting and continued pointing to the need for new workplaces. However, there was sufficient trust in the researchers in their role as the independent third party, that their proposal for a dialogue conference was accepted.

Phase three: Gaining legitimacy, finding roles, setting direction: The dialogue conference in Jan 2002 went very well and represented a breakthrough in several respects. It produced a strong verbal commitment from all persons present to work together across boundaries and find new solutions to the serious challenges, which the communities and the workplaces were facing. Workers and managers were surprised over the mutual openness. The discussions (mainly in smaller groups) revealed consensus on issues assumed to be contentious and so on. The managers' fears that the unions would revert to old positions, repeat dogmatic views etc. were not confirmed at all. Rather the workers and union leaders were quite jubilant to be involved, and a mood of enthusiasm emerged. The plant managers explained that they still had resources and autonomy to act, and that it was imperative to act in time. The groups generated a set of possible joint projects. These were presented and prioritised in a plenary session and have constituted the basis for most of the projects on which ICG has been working afterwards. Such outcomes are common for a well designed and well run dialogue conference, but for the participants the experience was new, and the success of the conference was partly attributed to its design, to which WRI had contributed.

The researchers wrote the conference report, which also gave a basis for the reflections over the conference in the Steering Committee afterwards.

The experience with this conference made us overcome the scepticism researchers normally meet when working in a relatively new environment. In the following 6 years we have organized, participated in and reported from 6 ICG dialogue conferences, and also run a special dialogue conference about the role of the regional R&D institutions in regional development. There seems to be little need to deal with these conferences in any detail here. We will only make some general points.

Between the conferences we have worked extensively both with the Steering Committee and Executive Committee (weekly) and also in a smaller task force to design the conference. This has been important both to defining the purpose of the conference, finding the issues to deal with and identifying the participants and to obtain a good connection between the work in the committees and the conferences, and to obtain research data.

WRI has tried systematically to expand the scope of the conferences both in terms of participants from other sectors, institutions etc, and in terms of dealing with broader issues. Gradually such proposals have been taken into consideration. Our proposals have been built on two arguments: Conferences tend to become more serious, committed and innovative with external participants. Insignificant internal conflicts are more easily avoided, and new ideas, alliances and possibilities may emerge. Even within a small “region” like Grenland/Telemark there is a surprisingly large and growing array of political initiatives, actors, projects and resources, which are, or could, become relevant for the purposes of VC2010. WRI did a small survey of such in 2002 (through the web, visits/interviews with a snowball technique etc) and produced a little report. It turned out a number of the actors were unknown to our partners in VC2010 and vice versa. For the next conference some of the contacts from the survey were proposed as participants, and were accepted.

Then in 2004 we made a larger survey/overview of relevant actors in Telemark commissioned by the Steering Committee and also wrote a smaller evaluation report for the development coalition.

Making the Steering Committee invite a broader spectre of participants to the conferences also of course is a way of broadening the support and scope for the VC2010 ideas and strategy. This is also one element in a strategy to avoid the continued domination of one sector of industry to the disadvantage of other sectors and to avoid unneeded conflicts. In practice we so far have seen that representatives from other sectors of work life through participation in the conferences have found that mutual interests by far dominate over sectorial ones, even though the ICG group still has a central position in VC2010 and the region.

Phase 4: Securing commitment, attempts to institutionalise and finding new resources, managing growth: In spite of the success of the conferences progress in the ICG projects was slow in 2003-2004. Some local union leaders repeatedly said their members were reluctant, and that more efforts would have to be made on the information and motivation side. Participation from the plants in the conferences had varied somewhat, and relatively few of the employees really knew ICG well. So from 2004 the Steering Committee decided that the *whole* Works Council from each plant should be invited to the conferences and expected to attend. Hence all local union leaders and top managers in each plant would have to participate. Further, members of the Executive Committee would visit Work Council meetings, the ICG development should be item number one on each agenda, and one WC member should be given special responsibility for the liaison with ICG. This effort to link the ICG development to the formal (collective agreement based) system for joint information and consultation in the enterprises was expected to help with developing commitment. At this time some of the plant managers on their side voiced impatience with the slow progress.

Further, to strengthen the commitment the regional leaders of LO and NHO decided each to run meetings with their ICG constituents (the local union leaders and the plant managers) in- between the meetings of the Executive Committee and the Steering Committee. This reform was expected to prepare the ground for faster, constructive decision making in the Steering Committee.

After the first three conferences and the associated expansion of scope for the activities, increasing legitimacy of the researchers and the new roles

being added (like more active involvement in the ICG Steering Committee, the smaller Executive Committee, task forces, the mapping of external actors, much closer work with the secretariat, a new management development program and so on), the action research issue has been how to institutionalise the change process and to increase capacity for project work. This was, and still is, a problem the researchers share with the secretariat, which by 2006 was overloaded, understaffed and underfinanced, too. The various joint projects had to be kept moving. However, the capacity to follow up became too low on the action side as well as on the research side. Efforts were made to find research financing and researchers in Telemark to involve. Approaching the new (experimental) Regional Council (for Telemark/Buskerud/Vestfold) and involving regional investors for support was another.

The dialogue conference in the early summer of 2005 drew about 120 participants and had two main items on the agenda: The Government's white paper on industrial policies, and a scenario for Grenland in 2010. This time a considerable larger array of external actors and development agencies were invited. The White Paper was presented by the leader of the commission, which had drafted it. At the conference the paper was debated and commented by national as well as regional politicians and other actors in plenary, and in smaller groups. In the final plenary a set of joint conclusions and recommendations to the national politicians were drafted, and later distributed. The main point was a request for holistic industrial policies, notably investments in infrastructure for industrial activities like those of ICG.

The second day of the conference was dedicated to the future industrial, economic and cultural development of Grenland. A video with animation demonstrated a number of the key elements; new industrial enterprises, rail, road and harbour facilities, the emerging university, the Ibsen theatre, the science park, new industries, the research centre, sports facilities, recreation, historic sites, new forms of tourism etc. All elements were formally covered by the existing plan for the development of the region, but were now presented in a coherent way. A spokesperson for the various elements/institutions commented on progress since last conference, and explained how and why the particular element would be developed, and the related chance of success.

The effects of using this new method for developing and visualizing a scenario seemed strong. The following group work and plenaries demonstrated agreement, enthusiasm, and engagement and produced numerous suggestions both for additions and details. The representatives of the external actors, like economic development agencies and programs, expressed clear interests in co-ordinating their own projects and plans with those of ICG and VC2010. This way also more economic resources might become available to ICG. In terms of illustrating and creating an understanding of the wider context of VC2010 the conference was an obvious success.

Phase 5. Reorganizing, shifting focus: While the individual ICG projects were moving forward, – albeit relatively slowly, – there was a shift also in research emphasis *from* the ICG level and the ICG Steering Committee *to* the next higher level in Telemark: the *VC2010 Steering Committee* and *Telemark's Scenario for 2012*. WRI had become (from 2005) also member of the Telemark VC2010 Steering Committee. At this stage ICG started taking specific initiatives towards this Steering Committee. Motivation for this shift was partly from the need to better co-ordinate the many national and regional initiatives and programs for economic development and innovation that co-exist in Telemark. Partly the need for finding financing of the many externally directed ICG initiatives was behind this new policy. We assumed the time was ripe for addressing wider issues, and moving on a broader front, through including new partners/stakeholders.

In principle this broadening of scope was positive. ICG now wanted more partners into the coalition, and new networks/groups of enterprises were keen to join. Through building a larger coalition by including other industrial groups or networks in the dialogue and together engage more regional and national actors in the process, more support for developing the industrial and cultural infrastructure of Telemark might be achieved. The success in 2007 with the joint work to secure a pipeline for gas from the North Sea with landfall in Telemark became an important symbol for the value of this collaboration. Further, in 2006 the Research Council announced its intention to merge VC2010 with a number of other regional development programmes with the intention to obtain synergies and to make more resources available. The announcement raised expectations about more financial support, not only

within VC2010 in Telemark, but also from a large number of other actors in the region, and a number of hidden conflicts, interests and competing purposes arose.

Before returning to the issue of research and industrial development strategies, we shall give a brief overview of the practical results from VC2010 in Telemark so far.

3. Practical outcomes

ICG Projects: As indicated the development of ICG was triggered by a general appreciation across the plants (management, local unions) that their respective corporations would not bail them out of their problems in coping with the global competition. Each plant would have to prove its competitiveness at least against other units in the same corporation in order to gain access to investments in new technology, products and capacity. Through ICG the plant managers/local unions developed their three stage strategy; 1) Search for possibilities for fast cost reductions and quality improvements through the sharing of resources, 2) Jointly engage in collaborative relationships with regional actors/resources to improve own environment/infrastructure and 3) Initiate other change processes in the environment, but leave the concrete development to other actors. Projects in this category were dealt with through the VC2010 Steering Committee.

Given the critical situation around 2001 (the three petrochemical plants running with very large deficits, the other four also losing money) immediate cost reductions got the highest priority. After some initial discussions in the Steering Committee and at the first dialogue conference, however, it was agreed that it would not be practical to work for new arrangements that would cover *all* the 7 (later 8) plants immediately. Rather, new arrangements could cover any number from two to 7 or 8. The Steering Committee believed once a new arrangement covering a few plants proved itself advantageous, others might join later. The main joint projects completed or in progress are listed in note (4).

The largest *cost savings so far* are on the maintenance side: The total maintenance costs of the process plants in 2002 amounted to ca NOK 680

mill a year (90 mill Euro). An ICG feasibility study indicated a *potential* improvement of NOK 100 mill. Norsk Hydro's earlier service company (Herøya Industrial Park (HIP), through its service center HPP) made bilateral agreements about plant maintenance with a number of ICG members. The most radical arrangement so far is with Borealis, which transferred *all* its plant maintenance work and lent its maintenance workers (ca 40 persons) to HIP. Borealis then is hiring back enough capacity to cover its needs, – which appears to be considerably reduced (maintenance costs reduced by ca 20% over 3 years). Borealis' maintenance workers are very happy with the new arrangement. They retain their formal employment with Borealis, but are hired to other plants through HIP. This way they experience a more challenging work situation, more variation and learning. The companies, which hire maintenance service from HIP, find that they get access to new expertise and learn new methods and techniques.

Finding new markets for services; In 2005 HIP also negotiated a joint maintenance contract with Hydro Polymers' and Borealis' plants in Stenungsund on the Swedish West coast. This shows in practice the potential for expanding the business of such semi-outsourced functions. In this case nearly 300 persons (workers and maintenance engineers) have been hired out by the plants to a *service centre* in Sweden operated by HIP. The two plants then hire back the capacity they need, and the excess capacity in the service centre can take business from other customers. Such partnership contracts are designed so that the partners share profits/loss according to a negotiated formula. Also these agreements have been made in full co-operation with the local unions.

Securing jobs for ICG employees: Gradually a system for absorbing redundancies in one plant through transfer (sometimes including retraining) to the others has been developed and was also very effective in the two cases of plant closures ("the common labour market"). Guarantees against redundancies in joint projects have been issued. After the labour market changed around 2005 and a shortage of qualified recruits appeared, joint (ICG) recruiting and training activities have been started.

Attracting new, advanced process plants to Grenland: This issue is important both for the utilization and further development of the infrastructure, for

the securing of employment for ICG workers and for the local unions' commitment to ICG. There are plans and projects for locating new process plants in Grenland, mainly connected to the coming gas pipeline. The new plants built since 2001 so far, are in other sectors of industry, but have more than compensated for reductions in ICG employment.

VC2010 Projects completed or in progress: The implicit change strategy in Telemark was to start with the ICG enterprises both to find synergies between these, and to initiate and support and possibly co-sponsor projects for which *other actors* in Telemark would take main responsibility. In a way this can be seen as using the strongest, best consolidated, group of enterprises as a "spearhead" to obtain needed change in institutions and policies in Telemark. The idea was that ICG should initiate and develop ideas, perform the feasibility study in collaboration with others and then hand over the responsibility to the external actors. The expanding scope for participation in ICG conferences, the setting up of the VC2010 Steering Committee and various meetings and conferences was a part of the strategy to enrol other actors in the development. The following list of projects illustrates this development:

A programme in entrepreneurship in Telemark's public schools: The Employers' Federation in Telemark around 1995 took initiatives to the start up of a programme in young entrepreneurship in schools in Telemark. The programme, which is linked to the Federation's national strategy, intends to cover all educational levels, "from playschool to university". In Telemark it is now covering most schools and levels and is deemed as very successful. Main financing has been coming from the Telemark regional council.

Masters programme in biomedicine: Through the dialogue conference in 2002 it emerged that the petrochemical plants due to new technology employed a number of laboratory technicians whose jobs would disappear. At the same time the leader of the Telemark Biomedical Forum (a group of biomedical companies) expressed the need for graduates at the MSc level. In a work group in which also a professor and the director of the University College participated, a new programme for further education of the technicians was sketched and put into effect 6 months later.

An international, primary and secondary school in Grenland leading up to International Baccalaureate exam in order to make it easier to attract foreigners into the district has been started by ICG. The school became operational in 2004 (see www.ISTelemark.no).

A network of mechanical industries: When Telemark joined VC2010, the leaders of LO and NHO there also wanted a network of mechanical industries in Grenland (the SVG group) to be included. The formation of this network started during the crisis after 1988, and had some remarkable achievements before it became rather dormant for some years. WRI was involved in the development of the SVG group for some years (Ryste 1992). Around 2000 new initiatives were taken to reactivate this network. At that time, however, VC2010 centrally was not able to finance research support to this network, so the local partners found separate funding and invited another research institute (FAFO) to take this assignment under the auspices of the VC2010 Steering Committee. During 2007 the *Grenland Group* (a fast growing engineering and construction corporation and key member of the SVG-network) moved its headquarters to Herøya Industrial Park and is expanding its collaboration with HPP.

The *Gas to Grenland* joint project has been run in parallel to ICG with the same actors plus the municipal and regional (Telemark) administration and politicians. It has been composed of several parts; technical and economic analysis, feasibility studies, information campaigns, regional and national lobbying and marketing. It has been successful in the sense that Parliament in 2005 decided, under certain conditions, to take a part of the investment in a new pipeline which will bring natural gas from the North Sea to South-East Norway with landfall in Grenland. The gas will secure energy and raw material for several of the plants there, in addition to open up for new industries. The Parliament also decided to establish the administration of a new national *Innovation Center* for the utilization of natural gas in Grenland. In 2007 the formal go ahead for the pipeline was declared, and enough private investors/customers (in Norway, Sweden and Denmark) had been secured to finance the project (without financial participation from the government) which now includes an extension of the pipeline to Sweden and Denmark.

A Science Center in Grenland: The idea was launched on the VC2010 dialogue conference in 2005 as a response to the diminishing interest for an education in the sciences among youth. The idea is to locate the center near the industrial park on Norsk Hydros site. This will be a joint venture between ICG plants, municipal and regional authorities and is now under construction.

Leadership Telemark: The social partners in Telemark have for years wanted that the University College should run executive programmes for leadership development. The programme should be based on democratic values, and contribute to better quality of management and the development of networks between managers across the private and public sector in Telemark. For a number of reasons the College has been unable to follow up this invitation. Therefore, in 2005 a jointly financed programme drawing on resources in Grenland (The Business School, Telemark TQM Center, etc.) and organized as a project under VC2010 Telemark, was started. This programme is being continued.

4. Indirect consequences of ICG and VC2010 in Telemark

There were three main practical purposes for ICG and VC2010 in Telemark; 1) To secure the future of the existing plants (and the jobs there), 2) to lay the foundations for the establishment of new enterprises (and jobs) in the region and 3) to make Telemark an attractive place to live. Obviously all factors deciding whether this really will happen are not under the control of ICG and the development coalition in Telemark. However, there are a number of indicators that ICG has had some significant effects beyond internal cost cutting;

New enterprises, new jobs: REC ScanWafer A/S, a new company making silicon wafers for solar panels set up a new, fast growing, plant in the Industry Park at Herøya following the closure of Hydro's magnesium plant in 2001. This way ca half of the jobs lost at Hydro, were immediately recovered at REC ScanWafer. The decision to locate the plant there was partly based on Grenland offering a very good infrastructure and workers for such industry.

The growth of the spun-off emergency handling and training functions into a new enterprise still is the best example of the potential for creating new

jobs through ICG. The perspectives for the *centres of excellence* in maintenance of course are similar. If they are successful in their “home market”, they should also be able to compete for contracts outside Grenland. ICG’s market studies indicated a considerable market in Scandinavia and should enable the new centres to grow considerably. At the same time the existence of such centres will mean that potential new enterprises in the region will meet a more complete and competent infrastructure.

New investments in ICG plants: Hydro Polymers and Noretyl decided in 2002 to expand capacity and upgrade the technology and now have completed an investment programme worth more than NOK 2 bn (ca. 250 mill Euro). Borealis also is investing in capacity increases, the French corporation Eramet Comilog, has invested ca 40mill NOK in its Norwegian plants (one of them is located in Grenland) over the last few years and seems determined to continue investments in its two Norwegian plants, while it has closed a similar plant in France. Eramet Comilog’s corporate management finds the ICG partnership of interest, and its existence seems to have influenced corporate decisions positively.

A new corporation taking over the three petrochemical plants: In 2007 the large British corporation INEOS decided to take over the Borealis, Noretyl and Hydro Polymers plants in Grenland with the intention of expanding there in tune with the arrival of the new pipeline and the following expanded availability of wet gas in Grenland. The purchase is seen as a positive sign by ICG. A corporation having petrochemicals as its core business now will own the plants.

More flexibility in the labour market: The development here is still at an early stage. A considerable part of the maintenance workers, however, are working across the cluster’s plants, and some also are hired to outsiders for extended periods. This may be seen as a breakthrough from a system in which the workers and local unions have been very strongly attached to their particular plant/employer. Today, in cases of redundancies or vacancies in the single plant, there is contact through ICG, and transfers may take place. E.g. REC ScanWafer has recruited a considerable number of its 300 workers in cooperation with ICG plants. Workers who transfer to new ICG joint ventures also have a guarantee that they will be reemployed in an ICG plant in

case the joint venture fails. When the Norske Skog Union paper mill (one of the ICG members) was closed for good in 2006, the apprentices and their contracts (around 20) were taken over by the remaining ICG plants. The total job loss amounted to ca 360, and all who wanted to found new jobs in Grenland largely through ICG and the Industrial Park.

The relatively small case of further education of laboratory technicians at the University College mentioned above is indicating a different mechanism for creating more flexibility and mobility in the labour market. The partners in Telemark want to utilize this possibility in larger scale. With this kind of measures they want to find constructive alternatives to the ordinary, cruder forms of outsourcing and downsizing.

Changing attitudes, new industrial relations: From the start there was a commonly shared assumption in the leadership of VC2010 in Telemark that the two main obstacles to the development of ICG would be resistance to change from the workers and from corporate headquarters. While the local and regional union leaders were to handle the relationship to the workers, – their constituents, – the handling of the relationship to corporate management fully lay in the hands of the plant managers. In practice the relationship to the local union members has been precarious and has given setbacks, slow-downs and sometimes full stop in the development of specific projects. The local union leaders have periodically been reluctant, they have had to go back to their members with more information and discussions, conferences have been organized, projects to be renegotiated etc. However, the union resistance to change now is considerably reduced. The explanation seems to be twofold: 1) The new joint ventures set up provide more interesting jobs and are expanding. So this form of “outsourcing” turns out as acceptable and even desirable also in terms of job security. 2) The pace set by management in the transformation has been rather slow, and much time has been spent on dialogue and information. Hence Hydro has been able to peacefully turn its two remaining main units in Telemark; The Industrial Park and the associated service centre (HPP) into independent companies. The other ICG plants welcome the changes. (5)

On the other hand, there has been more room for change vis a vis corporate management than assumed. As long as productivity/quality improve-

ments emerge, there has been considerable leeway for the plant managers to make changes, including getting involved with external actors like politicians. The detailed central control earlier exercised from corporate headquarters seems to be waning. In general the “cluster idea” in practice has been well received both from foreign as well as Norwegian controlled corporations.

Further, there is agreement across the ICG plants and local unions/employers that there is a need for redesigning the industrial relations structure, – from the current industry sector principle (chemical, petrochemical, general, mechanical etc) to a regionally based system with common collective agreements across the plants and local unions in the “cluster”. A dialogue with the national union leaders on this issue has been started.

A new, participative process for developing and implementing regional policies: This was the ultimate practical ambition for VC2010 in Telemark. Experience shows interesting and promising possibilities, – including the joint development of a scenario for Telemark through the large dialogue conferences and project work/extensive communication across levels and sectors. The close interaction between the development coalition and local and regional politicians and parties/political bodies seems to have precluded possible conflicts. It also seems that the involvement of Telemark’s representatives in the Norwegian parliament has been sufficient to get their active political support (across party lines) on a number of important issues, like the gas pipeline, investments in other kinds of infrastructure etc.

5. Discussion, concluding comments

In the introduction I contrasted the situation in Grenland at the start of VC2010 with the one around 1970, and concluded that few of the old obstacles were present in 2001, and that conditions to move ahead in the ICG group were favourable for a number of reasons. The most important changes in context will be discussed below:

New managerial concepts: During the nearly 40 years which have passed since the first “field experiment” on a green field site in Grenland, some large changes have taken place. In 1966 only the CEO of Norsk Hydro and the

local union president at its Grenland industrial complex saw both the social and economic potential of this participative approach to management and organization. When the same CEO in 1973 had to direct his attention elsewhere, the progress stopped and gradually was reversed. At that time efforts to work together to create conditions for a more participative, learning work organisation in general, was seen as an attack on managerial prerogatives and as going against all established concepts for productivity.

By 1990 advanced manufacturers in the process industry in the Western world had left the bureaucratic/tayloristic model for organization, and were introducing team based, integrated, decentralized, flexible forms. Japanese concepts like Total Quality Management in its European (EFQM) version, Just in Time, and related ones like Business Process Reengineering were in many cases part of this development. In the most advanced process plants in Norway (and probably elsewhere) today, boundary-spanning networks are supplementing or balancing the hierarchy through linking all employees to outside resources (Qvale 2008). Literature on regional innovation systems, also emphasise the effectiveness of networks across enterprises and other actors like R&D centres in the regions (Edquist 1997; Finsrud 2004). However, most of the earlier literature overlooks the link to internal participative processes (team based organization, broad participation), which repeatedly has been demonstrated as a necessity for individual and joint learning, action and commitment to change. More general contemporary literature on strategy come out with similar suggestions (see e.g. Miles et al. 2005; Sabel 2006) complementing e.g. Porter's (1998) point that most factors decisive for an enterprise's ability to compete on the global market are to be found in its immediate environment.

So in a way the socio-technical participative approach to organization design has become mainstream, – at least within this sector of industry where the technological development is very conducive to it (continuous production, fully automatic, closed processes, advanced ICT systems) (Qvale 2008; Trist 1970). The Grenland process industry's identity and reality have shifted from being raw material/energy based, to seeing itself as being knowledge based and a part of the knowledge economy. In Norway most enterprises in this sector also have retained the Nordic model for industrial relations, i.e.

maintained and further developed the collaborative/participative approach to enterprise development. This way also the contentious issue of downsizing could be handled through union participation and without much conflict through the 1990's. Constructive solutions have been sought and found, – given the joint acceptance of the need to change.

The conclusion at this point is that in Telemark there has been conceptual support and inspiration from heavy international trends in the process industry, to which the local partners have related within a trustful, co-operative Norwegian industrial relations tradition.

The role of action research: At the national level the central labour market organizations (LO and NHO) together with action researchers by 1999 had convinced the Research Council and the government that Norway should launch a new R&D programme on regional innovation and value creation building on the competence and relationships which had been established through the Enterprise Development 2000 programme (Gustavsen et al. 1998) which was about to end. In principle this was a break through for LO and NHO. Together these parties were connecting the field of industrial relations to economic and industrial policies at the national level, – and to some degree they were heard. Implicit we see another interesting change in the parties' thinking: The long-term perspective needed for desired change in work life. On earlier assessments of such reform programmes, the quest for "a quick fix or nothing" was paramount also from their side. Now they were realising a 5-10 years perspective was needed, and were able to make the Research Council accept this.

Research strategy; The issue of "diffusion" or scope: In relation to the general issue of "diffusion of experience" from successful local enterprise level projects, ED 2000, VC2010 and the development in Telemark may represent an interesting alternative to earlier attempts to obtain large scale change. In Norway until the mid 1990s we have in various ways tried to organize enterprise and network level projects so that central, national actors, like the leadership of unions and employers' federations, government agencies, universities and schools could learn from the experience and henceforth change policies and practices in own organizations (Qvale 1994; 2000b, 2007; Gustavsen et al. 2008).

Rather than trying to influence national policies and actors directly, the VC2010 programme was designed so that the two major national labour market organizations (LO and NHO) together with some researchers concentrated on designing a national R&D programme jointly with the research council. In principle it was a programme for decentralizing the allocation of research money. This programme should give resources and room for regional development coalitions across the nation (with the *regional* leaders of the labour market organizations, regional networks of enterprises and R&D centres in the key roles) and hence development across a very broad front.

Behind this idea of utilizing a strong consolidated actor to obtain changes in the regional infrastructure and coordinate development activities in Telemark, lay an appreciation of the current structure in the Norwegian regions. A surprisingly large number of well-meant programmes and initiatives stemming from different ministries and government agencies operate in parallel in the regions: Education, training, retraining, rehabilitation, economic development, financial support to enterprises, entrepreneurs and impoverished districts, initiatives to promote female employment, financing of incubators, industrial parks and R&D centres and related institutions and so on. Through one of VC2010 predecessors, SBA, we identified between 200 and 300 such national initiatives, agents and agencies (Qvale 1994). The general appreciation of this flora of actors and activities in work life was that they tended to compete and only rarely fit the needs of the regions/local communities/enterprises. The conditions to be satisfied to obtain a grant or expert support from these centrally initiated programmes tended to divert the attention of the receiving part away from its core purpose. Attempt to obtain coordination of such initiatives at the regional level, tended to create conflicts between public agencies and the regional and national administrative levels. The idea behind VC2010 was as usual: to spend a limited amount of financial resources to mobilize and coordinate greater resources in the region and hence obtain “diffusion” or a “multiplier” effect. The various regional development agencies and resources like the regional university colleges and FoU centres were the obvious targets for this strategy. The creation of the new programme, VRI, in 2006 epitomizes this perspective.

To complicate matters further, the long awaited reform in public administration in Norway; – a decentralization process connected to a review of the role, functions and autonomy of the three administrative levels (nation, county and municipality) has not yet materialized. The reform was expected to bring supplementary funding for regional development to the VC2010 activities in the regions. However, Parliament was unable to agree on this reform. Partly because of this, the VRI-programme became a compromise across diverse interests (regional development, employment, research, economic development/innovation etc). The expected expansion of the budget for the continuation of the VC2010 activities in VRI was seriously delayed. When the VRI programme started moving in 2007, numerous new actors and agendas were mixed into it, considerable confusion and conflict arose, and momentum was lost. In Telemark a one-year standstill emerged. A new start, however, now seems to be coming.

The shift in the work life development projects in Norway from concrete redesigning the work organization in the 1960s towards gradually more general, indirect, participative methods like search and dialogue conference opens the process up for broader participation, and the development of a more general common understanding of need for change and appropriate measures to achieve common objectives. However, through these changes in research strategy one may easily miss out the involvement of the individual in the daily work situation which was the point of departure in the 1960's. In Norway in general a large proportion of the workers still is kept in routine work with little room for learning and discretion in their daily work situation. Henceforth, their willingness and ability to participate in and influence the outcomes of more general participative change processes will be limited. In the longer run, we might also expect their and the unions' commitment to the process will be waning. However, in the case of ICG we know from our own involvement in the single plants, that a transformation of the work organization towards participative, teambased forms had taken place through the 1990s in the plants. Thus the employees in general experienced learning and personal development in their daily work situation, and were better able to engage constructively in the more general development processes. We as-

sume this is an important factor behind the results achieved in Telemark through VC2010.

VC2010 in Telemark: Different perspectives on its outcomes

As appears a number of organizational innovations and new ventures came out of the ICG/VC2010 activities in Telemark. Some have given considerable cost savings, others have contributed to the securing of employment and some have created new jobs. Some of the planned projects will have very large positive ramifications in the whole region. Helped by a positive trend in the economy the feeling of crisis seems gone, there is a shortage of labour in the region, and the population shows sign of growing. The dependency upon a few, large, corporations has been reduced, and the population seems more aware of and able to handle its own destiny. Of course there is no one to one relationship between VC2010 and these results.

Some of the innovations in Telemark are quite radical and new, like the emerging flexible joint labour market and the sharing of technical resources across the process plants. Others like the setting up of a Science Center to inspire youth to studies of the sciences seem more common. However, two other perspectives on these innovations seem more important. The first is that the mechanisms set up through ICG and VC2010 in Telemark may indeed create *directive correlation*, – to use Sommerhof's (1950, 1969) concept, – across a large variety of factors and actors most of which earlier may have been uncoordinated, irrelevant for each other and sometimes competing. This strategic perspective on the regional development aimed at through VC2010 probably is the most important. If VC2010 in Telemark is able to create coordinated change across a multitude of factors/actors relevant for economic, social and cultural development in a longer time perspective, then indeed we might expect the needed sustained change. The question is, are there still pressing issues, ideas, leadership and expanded partnerships around to promote further changes in participative ways in Telemark?

As have appeared there were changes after 2006 in the ICG plants, the national economy, in VC2010 and in the regional leadership, which at best will

slow down the development. On the other hand, other changes may support further development;

Within the ICG members Norsk Hydro transformed its large technical service units (HPP) into an independent company, which will give it a clearer identity as a supplier to ICG rather than a member. Further the British corporation, Ionos, bought the Borealis, Hydro Polymers and Noretyl plants in Grenland. This consolidation probably will be positive for ICG's further development after new management is in place. Further, rapid expansion of the new plants inside the Industrial Park, notably RECSanWafer, also is taking place. Its third plant there for the production of silicon wafers for solar panels is near completion. The engineering/construction industry in the region is expanding, and one major group moved its headquarters to the Industrial Park in 2007. Also the other industries in the region are doing remarkably well, so through 2007 a shortage for both skilled personnel and land for industrial development emerged. At the Industrial Park at Herøya, considerably more people are employed now, than in 2001, and current plans indicate further expansion there, – reaching 4.500 by 2011. So for the time being the Industrial Park seems the most dynamic element among Telemark's industries.

Most of the initial “souls of fire” leading the development of ICG and VC2010 in Telemark (the regional leaders of NHO and LO, plant managers, local union leaders, administrators) have since 2006 been replaced by newcomers. Today an almost entirely new generation has taken over. We do not yet know whether the successful collaboration across company and institutional borders in the past will continue under these new circumstances.

As the feeling of crisis and corresponding necessity of working together in order to survive, has been replaced by optimism and a struggle to manage expansion, find new workers and so on, one might say VC2010 has completed its mission in Telemark. To move on there is obviously a need to identify new, important objectives, to find a number of new participants, new leadership and new financial resources.

The turmoil following the reorganizing of VC2010 from 2006 exacerbates problems with the continuation of the collaborative efforts in Telemark. Rather than supporting the existing development coalition and the role of LO

and NHO in the coordination, the new programme, VRI, brings in numerous new actors and agendas plus a substantial increase in funding. In principle VRI opens up for considerable regional participation in decision-making over the use of the research money for regional development. In practice, however, R&D actors without previous involvement in VC2010 so far rather seem to recreate the earlier fragmentation of the development activities in the region. A major effort to bring these actors together seems to be needed.

Another perspective is that the various projects and developments at this stage mainly should be seen as “prototypes”, – relatively small scale demonstrations of interesting possibilities in the form of organizational innovations which, if expanded and used in larger scale, may lead to large scale desirable change in Telemark or elsewhere. These perspectives are not mutually exclusive, but may coexist.

On one score the VC2010 project in Telemark definitely has not yet succeeded. The intention from 2001 was to build competence and capacity in action research at the University College in Telemark and gradually shift the research tasks from WRI to the College. This, however, the development coalition has been unable to achieve, – in spite of numerous attempts. The college itself has prioritised different fields of research, which largely reflect its traditional structure/disciplines and geographical split (4 parts spread across the county). The four R&D units are each linked to one of the 4 parts of the College and have been unable to join VC2010.

The University College, though, has been represented in the VC2010 Steering Committee from its first days through its director for external projects. Further, the College’s leadership has been invited to all major events, conferences etc. and has made important contributions. The initial idea was to have a small group of graduate students at the college working with WRI researchers in the VC2010 projects. When the VC2010 PhD programme started in 2003, the College was invited to use one or two of its PhD scholarships in this connection, but found it had other priorities. Later the ambition to qualify for status as University by 2013 has further taken its interest away from action research and regional development and rather pushed in more detached academic directions. The structural problem in Telemark’s system for research and higher education is increased by the coexistence of these

four independent R&D units and the four sections of the College. In spite of external pressure, it has not been possible to change the demarcations between these 8 units and introduce a new multidisciplinary field of research.

So the issue of institutionalisation of the change process through the college still seems unresolved. From the VRI program expectations are that the county council should take the role of convening the various parties. Pending this to take place, the continuation of VC2010 in Telemark was stopped from the middle of 2007 and was not restarted until March 2008 with VRI working in parallel to some of the regional R&D units. However, there may be other ways to promote the further development in Telemark beyond utilizing local action research units.

One obvious option for further development in Telemark is for the local leadership e.g. in the labour market organizations, to concentrate on other industrial groups, – like a network of ICT companies, the biomedical/biotechnical group, the large SVG (engineering) network, the Herøya Industrial Park in general, and/or some enterprises in the other districts in Telemark. At some stage also the ICG development also is likely to pick up again and join. A definite conclusion from the work with VC2010 in Telemark so far, is that without one or several strong and determined, democratic oriented groups of enterprises, it is impossible to obtain “directive correlation” (Sommerhof 1969 op.cit) across the large number of potentially useful development resources in the region. The many extremely uncoordinated initiatives from such actors in the wake of the announcement of the VRI programme underscore this point. Clearly the VC2010 development coalition has not been strong enough to deal with this turmoil, which largely has been caused by the remaining inability of the government and its administration successfully to reduce the high degree of centralization in the Norwegian planning and administration. The announced reform in Norwegian administration towards decentralization and simplification has not taken place and VRI is in danger of becoming just another independent district supporting initiative.

Summing up

The experience from Telemark has demonstrated new opportunities for increasing the rate of organizational innovation and economic development at the *regional level* as well as promoting various forms of participative democracy. It also has demonstrated how the new mechanisms for development can link to the regional political system in constructive ways. As always, however, expectations both among researchers and their regional partners (the development coalition) have been rising faster than what has been achievable in practice. The “prototypes” developed in small scale in Telemark convinced our partners that VC2010 had the potential of creating large-scale change there. However, the institutionalisation of the change process has not yet taken place as intended. E.g. one key part in the original research strategy, to build local capacity and competence in action research in a regional R&D institution (the University College in Telemark), – has not succeeded. In fact it has not even started. However, the new programme, which is intended to act as a continuation of VC2010, will show how important the presence of such regional resources will be.

The research strategy in Telemark was built on a number of assumptions about the situation there; the power structure and potential actors who could spearhead a participative change process and of course on experience from similar change processes in Norway and abroad. Experience show that a number of these assumptions were realistic and have lead to a desirable project development. In particular the regional leadership of the labour market organizations in Telemark has handled its new roles in developing the region remarkably successfully. Thus interesting new roles for the industrial relations system has been demonstrated. Further, starting with the best-consolidated, strongest, network of enterprises and gradually stronger linking this to other actors and networks of firms in the region has proved itself an effective approach. The absence of conflicts of interest between different industrial networks and groups in the wake of this indicates that the process has been quite inclusive.

The main organizational innovations developed and tested in Telemark (new organizational forms, new ways for working together (cluster, networks, regional development coalition, common labour market, ideas for new industrial relations forms, the establishment of new industries created through the merging, professionalizing and commercialising of the plants' support functions) are developments of general interest, it seems.

The scope and depth of the development has increased well beyond what earlier has been achievable in Telemark. In reality, the limiting factor has not been in interest, involvement and aspirations in the developing coalition's leadership, nor in the plants. It took some years to overcome local union reluctance in some plants, but afterwards the development was hindered by lack of capacity in project development. The change from VC2010 to VRI in 2006/2007 therefore in principle was welcome. But the much larger financial resources for development (which were promised) did not materialize, and the process has stagnated at least for a while. Because this change coincided with a turn in the economy, changes in leadership and ownership in the plants, a review of the research strategy is needed if new progress is to be made.

Research results: It seems to me that the most interesting side is the effectiveness of the chosen research strategy, the analysis behind, the methods chosen and the practical outcomes of the process. In this article most of the text is devoted to this. In terms of methods we have mainly used well-established ones with the addition of video-animation to illustrate and update the scenario. This was developed together by the members of the development coalition and given contents by the participants in the yearly dialogue conferences. Yearly updating and concretisation of the various ideas and plans for Grenland and Telemark has been important for maintaining and increasing the commitment to the changes. The potential of a regional, participative, approach to work life development has been amply demonstrated, but far from fully realized.

The institutionalization of democratic change in worklife and the Telemark society: This is an open issue. Certainly the key persons and actors in VC2010 there, have learnt from their experience, want to and are able to continue. The original development coalition (the VC2010 Steering Commit-

tee) has been dissolved and a broader, more diverse Committee has been formed. At least temporarily the leadership of the regional labour market organizations has been put on the sideline. The funding for further action research is temporarily stopped pending the approval of a revised research plan. In the next phase (VRI) the regional (county) council is to have the coordinating role over the direction of VRI in Telemark and the allocation of resources to R&D. The main challenge then seems to be to restart the process and build new development coalition.

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Appendix

1. Telemark is a somewhat special case in Norway with its dominating group of advanced process industries in close proximity to each other. Around these there is a relatively weak and fragmented industrial base. However, all the process plants are under direct pressure from the international competition and struggle to remain competitive. The plants' managements had no history of working together before the regional leaders of LO and NHO started to bring the plant managers and local union chiefs together in the early 1990s. The regional NHO leader had a history of working in one of the process plants, becoming local union president,

elected mayor of the central city in Grenland (Porsgrunn) before being appointed regional director of the Employers' Confederation (NHO) in Telemark. Together the two regional leaders had for 10 years worked systematically and successfully through regional political parties, the public administration and in the numerous boards and committees in which the labour market organisations are represented. This way a high level of agreement on a number of important issues related to the region's development had been established across the various stakeholders and also written into policy and planning documents for the region and the Grenland municipalities. As indicated above, also some joint school/industry projects had been launched.

2. *The Grenland Industrial Cluster* (ICG) for which some key statistical data are given below (figures from 2004), has consisted of the following advanced process plants;

	Turnover MNOK	Export ratio	Local purchases M NOK	Employees	Apprentices I
Borealis AS	2.000	95%	217,5	520	36
Eramet Comilog	800	100%	50	220	15
Herøya Industripark (HIP And HPP, incl Yara (ekskl. PVC-fabrikken)	6.000	90%	500	2.600	75*
Hydro Polymers AS	2.300	90%	250	350	16
Norcem AS	900	30%	70	250	15
Noretyl AS	2.200	-	85	166	12
Norske Skog Union	800	80%	74,2	340	20
Total	15.000	>80%	1246,7	4.446	189

Yara became a separate corporation in 2005. Norske Skog Union was closed in 2006. HPP (Hydro's earlier service units) became a separate company in 2007. HIP (the Industrial Park which is fully owned by Hydro) is host to HPP and a number of newly established industrial enterprises of which REC ScanWafer now is the largest. Total employment within the Industrial Park is expected to reach 4000+ by 2010. The group of petrochemical plants, Noretyl A/S (the cracker), Borealis (olefins) and Hydro Polymers AS (PVC), were bought by INEOS, – the

world's third largest chemical corporation, – in 2007. HPP has recently been sold to a large German engineering group (Bilfinger Berger Industrial Services AG).

3. According to the VC2010 concept this *development coalition* (Gustavsen et al. 1998) should be composed by the leaders of the regional labour market organization and representatives from enterprises and other key regional actors (administration, economic development agencies and similar). Researchers from 10-12 regional university colleges across the country receive financing to provide (action) research support to the coalition. In the longer run, the general idea is to institutionalise the regional colleges' role as regional development actors. A PhD program and various other activities (publications, seminars, conferences, exchange of researchers) organized by the Research Council constitute an infrastructure supporting the involved research centres.

4. Some of the joint projects were initiated before ICG formally was formed in 2001. The list below indicates which of the plants had become active in the projects/joint ventures by 2006:

ICG Projects completed	Participants
<i>Joint intake of apprentices:</i>	Borealis, Eramet, HIP, Polymers, Norcem, Noretyl, Union, Yara
<i>Emergency preparedness: (firefighting, safety training)</i>	Borealis, Eramet, HIP, Polymers, Noretyl, Yara
<i>Maintenance:</i>	Borealis, Eramet, HIP, Polymers, Noretyl, Union, Yara
<i>Occupational health service:</i>	Borealis, Eramet, HIP, Polymers, Noretyl
<i>Gas to Grenland (lobby)</i>	Borealis, HIP, Polymers, Noretyl, Norcem, Yara
<i>Joint public relations/ICG Website:</i>	Borealis, Eramet, HIP, Polymers, Noretyl, Norcem, Yara
<i>Centres of Excellence:</i>	A joint workshop and organization for machining and the maintenance of valves.
	A joint workshop and organization for the maintenance of electric motors.
	Industrial bricklaying
<i>Supply Chain Grenland:</i>	The project is to cover all aspects; harbours, quays, cranes, warehouses, shipping lines, containers, roads and road transport, railway lines and tunnels.

The projects have been defined through the dialogue conferences, evaluated by the ICG Executive Committee and Steering Committee and then allocated to

composite project teams lead by specialists from the ICG member plants, given a budget (financed by the plants) and time schedule.

The Center of Excellence for industrial bricklaying quickly was established bilaterally between Eramet and HIP and gave immediate savings to Eramet in the range 5-10 mill NOK a year. The two other centers are still under development, have been considerably delayed, but are expected to be operational by the end of 2007.

The *Supply Chain Grenland* project has the largest potential for cost savings. The immediate cost reductions through joint coordination across the ICG plants are in the region of NOK 50-60 mill (7-8 mill Euro) a year. If and when planned public investments (NOK 4-6 bn, 6-700 mill Euro) in better roads, railway and harbours appear, saving on the transport side will amount to several hundred mill. NOK per year. Supply Chain Grenland covers a wide range of issues; but for the time being ICG-efforts are concentrated on the harbour development, like coordinating the development and use of the harbour facilities of different corporations and municipalities. A new joint container terminal and feeder lines are being planned. A new cargo ferry between Grenland and Denmark started in 2004. Public work on deepening and widening the shipping lane to the plants is in progress and will allow much larger ships pass through.

Across the ICG enterprises there are ca 180 apprentices following a joint training programme, which also guarantees employment for the participants in one of the plants. In terms of emergency preparedness, two new enterprises have been established, one covering the 3 petrochemical plants and offering fire fighting and emergency training in house and through the sales of services locally and internationally like building a new safety training center in the Middle East.. This is so far the clearest case of the potential for new business and employment through the spin off and professionalisation of a support function.

The voluntary merging of the fire fighting units of the three plants, gave an immediate reduction in manpower needs for the preparedness function, and opened for an expansion of the training facilities which already were among the most advanced in Scandinavia. Offering certified training courses to other industries (including shipping) has expanded the market and enabled the new company to recruit more people. Further, some of its specialists now are also working as consultants designing similar training facilities and programs in other countries.

The employees, who were transferred to the new jointly owned company, are very happy about the changes. The services provided to the plants are equal or better than earlier and considerably cheaper for the individual plant.

Another new company taking over the emergency preparedness in the same way for the plants at HIP was set up somewhat later.

The occupational health units of the petrochemical plants also were merged into a new company which now also is offering such services to the local municipality. There is no change in the services offered to the plants, but the costs have been reduced.

5. The general economic environment for the industries in Telemark, as indeed in most of Norway, has changed from being extremely difficult around 1999/2002 to becoming extremely benign after 2005 due to shifts in international economic trends, – notably effects from the expansion in China and other east-Asiatic countries. As producers of raw materials/commodities for manufacturing industries most of the Telemark plants have enjoyed a dramatic increase in demand, product prices and profits during the last few years. The redundancies from the closure of Hydro's magnesium plant and Norske Skog's papermaking plant have been absorbed by the new enterprises (notably REC ScanWafer), and the integration of the three threatened petrochemical plants under new owners, may give these units new investments and a new lease of life.

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